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JPRS 83833

7 July 1983

China Report

SCIENCE AND TECHNOLOGY

No. 202

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7 July 1983

CHINA REPORT

SCIENCE AND TECHNOLOGY

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APPLIED SCIENCES

COUNTRY DEVELOPS PULSE ELECTROPLATING TECHNOLOGY

OW231003 Beijing XINHUA in English 0848 GMT 23 Jun 83

[Text] Beijing, 23 Jun (XINHUA)—Scientists here at the Institute of Computing Technology of the Chinese Academy of Sciences, have successfully developed a pulse gilding technology, the first of its kind in China, after conducting more than 2,000 tests in three years.

Gold is used to gild components in order to add to the oxidation and vulcanization resistance, and to reduce contact resistance. The coating is also anti-corrosive and abrasive-resistant.

The technology has been put into trial production in five radio component factories in Beijing and gilded over 2 million pieces. Compared with the conventional direct current gold-plating, the new technology can save 30 percent the gold and lower electricity consumption by one-third, developers say.

The process passed technical appraisal in Beijing at a meeting attended by 110 specialists in electroplating from more than 70 units throughout the country.

Apart from the wide application in electronics industry, the pulse electroplating technology can be used in the decoration of consumer goods, the repairing of machine parts, and surface treatment of steam turbines and airplane skeletons.

The application of this technology can also save other precious metals such as silver, chromium and barium.

The process has been well received by the electroplating factories in the country and a number have requested for technology transfer. The Institute of Computing Technology plans to run a training course to spread the technology in China as quickly as possible.

The pulse electroplating technology was developed in the later 1970s elsewhere in the world. So far, only a few well-developed industrial countries including the United States, Britain and the Federal Republic of Germany have applied the technology to production.

APPLIED SCIENCES

VERSATILE 'Y-8' CAN PERFORM WIDE RANGE OF DUTIES

Beijing HANGKONG ZHISHI [AEROSPACE KNOWLEDGE MAGAZINE] in Chinese No 5, May 1983 pp 2-4

[Article by Fan Zhenggang [5400 2973 0474] and Pei Zhaochuan [5952 0340 1557]]

[Text] One cold winter, construction work was taking place along the shores of the Huang He to build a vast airdrop test field. Gathered on the test field were laborers, officers of the People's Liberation Army, engineers, and specialists from all over the country. Despite the bitter cold wind of the central plains, they were all concentrating intensely on their work. With a roar of engines, a four-engine turboprop transport passed overhead. Gleaning in the sun, the silver aircraft appeared particularly handsome and agile; the red emblem "8 1" was bright on a background of white clouds and blue sky. People on the test field all lifted their heads and stared. At an altitude of 600 meters, the aircraft returned to the test field, and its wide cargo door near the tail section swung open. Suddenly a white guidechute opened in the wind, carrying a cargo from the plane, and descended rapidly. When it reached an altitude of 400 m, five other colored parachutes opened simultaneously, like a giant flower in the sky. Instantly, the cargo suspended below the parachutes began to decelerate. Now, the cargo was clearly in view; a truck on a platform. The truck and the parachutes slowly descended and gently touched the ground. When the driver drove the unscratched truck toward the review stand, people cheered and jumped with joy then they ran toward the truck.

This was the scene of an airdrop test by the Chinese-made "Y-8" aircraft.

Applications of the "Y-8"

The primary applications of the "Y-8" are: air transport, airdrop, and airborne operations. The cargo bay is 13.5 m long and 2.4-2.6 m in height; the cylindrical section has a diameter of 4.1 m. The cabin is roomy, fully equipped, and well lighted. It is equipped with a crane for moving heavy objects as well as power winches; installed on each side are folding bench seats and rollers.

Air Transport. The "Y-8" can carry out various transport missions under all weather conditions. It can carry two trucks (Fig. 1) or 2 tons of boxed cargo.

During wartime, it can carry 96 fully armed soldiers. As a medical rescue aircraft, it can carry 60 seriously injured (the cargo bay accommodates 60 stretchers arranged in 4 rows and 3 tiers), 20 lightly injured, and 3 physicians. During one rescue mission, the "Y-8" actually carried over 100 critically injured people to safety.

Airdrop. The "Y-8" can carry out various airdrop missions during either wartime or peacetime. In wartime, it can airdrop trucks, artillery, recoilless gun trailers, command vehicles, weapons, ammunition, and other military materiel. In peacetime, it can airdrop food packages and medical supplies to victims of earthquakes, floods, hail and avalanches. In the case of a ship in distress at sea, the "Y-8" will be able to reach the ship in time to airdrop lifeboats, survival gear, radio transmitters, and food supplies to the victims. During the Vietnam war and on several earthquake rescue missions, the "Y-8" made significant contributions with its airdrop capability.

Airborne operations. The "Y-8" can also carry out airborne missions. Each "Y-8" can accommodate 60 paratroops. In peacetime, it can be used for parachute training exercises. In wartime, a squadron of "Y-8" aircraft can penetrate deep into enemy territory to dispatch a large number of paratroops in a surprise attack.

Main Features of the Aircraft

The "Y-8" is a medium transport aircraft fitted with four Chinese-made WJ-6 engines. It has many desirable features such as low fuel consumption, a good safety record, and versatility.

Powered by four engines, it has a greater safety margin than a single-engine or a twin-engine aircraft. If one of the engines fails on the ground, the aircraft can continue to take off; if any two engines fail during flight, the aircraft can still land safely.

Equipped with low-pressure tires, the "Y-8" is able to take off and land not only at certified airports of different classes, but also at temporary airfields with grass, snow or sand runways, as well as open fields during wartime. The aircraft is equipped with a turbine-driven starting generator, which can start the engines without relying on ground power sources, thus providing enhanced mobility. The "Y-8" has left its tracks all across the country: from the Xinjiang-Tibet plateau in the west to the coast of Jiangsu in the east; from the frigid provinces of Nei Monggol and Heilongjiang in the north to subtropical Hainan Island in the south.

Installed on the cargo deck are retaining rings to ensure the safety of cargo during flight. When the cargo deck is equipped with a roller system, heavy cargo can be quickly loaded onto or unloaded from the cargo deck. In addition, there are holes on the cargo deck for installing seats or stretchers so that the cargo bay can be readily modified according to the particular mission.

Another feature of the "Y-8" is its long range and endurance. The maximum fuel capacity of the "Y-8" is approximately 22 tons, and its maximum flight time is over 10 hours. Its range at a cruising altitude of 8,000 m exceeds 5,000 km. Thus, the "Y-8" can make non-stop flights across China in either an east-west or north-south direction.

Aircraft Structure, Systems, and Equipment

The "Y-8" has an all-metal, semi-monocoque structure. The fuselage is made of laterally-stressed frames, longitudinally-stressed purlins, and cover skins. The fuselage is divided into four sections: the forward section, the mid-section, the tail section, and the tail compartment. The forward section and the tail compartment are sealed against air leaks. The forward half of the forward section is a roomy and comfortable cockpit with a wide field of view. Members of the flight crew include the pilot, co-pilot, navigator, engineer, and radio operator. The rear half of the forward section is a cabin for the other crew members. The mid-section of the fuselage is not sealed, and is primarily for carrying cargo. The tail section of the fuselage is also not sealed; it contains the main cargo door and the main support beam. The tail compartment is a rear gunner's turret; it contains two aircraft cannon for guarding the tail section.

The "Y-8" has a cantilever type, top-mounted single wing in three sections: the center wing, the mid-wing and the outer wing. The wing has an angle of installation of 4° ; the mid-wing section has a 1° dihedral, and the outer wing has a 3° inverted dihedral; the entire aircraft looks like a seagull with its wings fully spread. The mid-wing section has a double-slotted retractable flap, and the outer wing has a differential aileron. Installed between the front and rear spars of the wing are soft fuel tanks, and the mid-wing section is a structural fuel tank. The vertical and horizontal tails are of the conventional trapezoidal design, located at the rear of the tail section.

The landing gear is the retractable tricycle type. The main is retracted into the fuselage along the wing span; the nose gear is retracted rearward into the fuselage. The landing gear is equipped with low-pressure tires which are installed on eight main wheels and two nose wheels. During taxiing on the ground, the front wheels can be turned via the turning mechanism which is connected to the rudder control. The main wheels are equipped with hydraulic brakes.

The "Y-8" has two independent hydraulic systems, each with its own pressurized oil tank, oil pump, and accessories. In addition, there are also manually operated and electrically operated pumps.

The control system consists of the main control and auxiliary control. The main control system is operated by rigid control rods.

The air-conditioning system draws air from the 10th stage of the compressor to pressurize the sealed cabins. When the aircraft is flying at high

altitude where the ambient temperature is 50°C below zero, the air-conditioning system can raise the cabin temperature to approximately 20°C.

The oxygen supply system provides oxygen in gaseous form. The total capacity of the oxygen bottles can supply oxygen to 100 persons continuously for 3 hours.

The de-icing system uses two different types of heat sources, hot air and electric heating. Hot air de-icing is used on the leading edge of the wing and the forward part of the engine inlet; electric de-icing is used on the leading edge of the tail, the propeller blades, the spinners, and the cockpit windshield.

The aircraft is equipped with both soft fuel tanks and structural fuel tanks. The fuel tanks are filled with inert gas and equipped with an automatic fire extinguishing system. The system can supply fuel to the engines either according to some automatic sequence or according to a manual sequence controlled by the pilot.

The power supply of the "Y-8" is a combination a.c.-d.c. source. The main power supply consists of four a.c. generators. In addition, there are a 36-volt three-phase a.c. supply and other auxiliary power sources.

The aircraft is equipped with various navigation and communications equipment such as shortwave radio transmitters, an ultra-shortwave command station, radio compass, radio altimeter, navigation radar, and doppler radar. It is also equipped with navigation instruments designed to operate at night and under all weather conditions. The main instruments include automatic navigator and autopilot.

Flight experience with the "Y-8" has shown that it is an aircraft which will play an important role in the future of this country.

Figure 1. The "Y-8" Can Carry Two Trucks

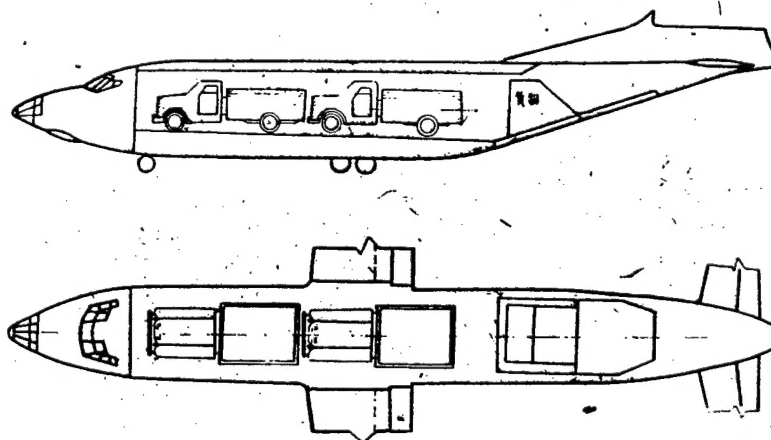
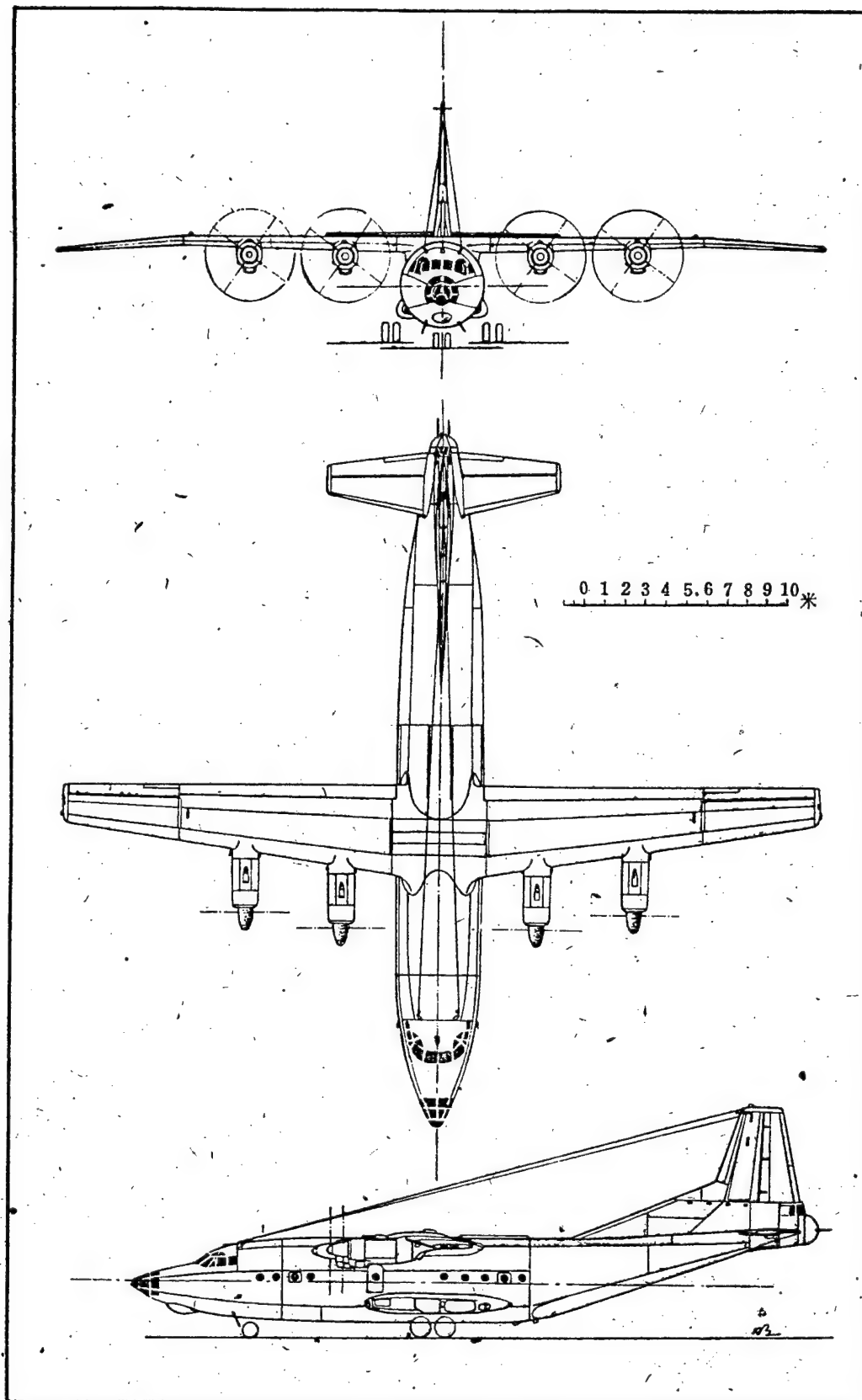
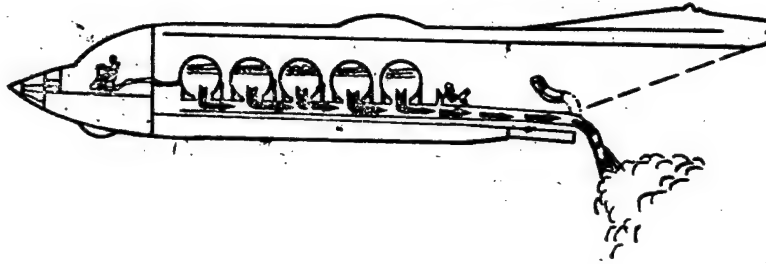


Figure 2.





Key Technical Data of the "Y-8"

Length	34.02 m
Height	11.16 m
Wing span	38.00 m
Wing area	121.86 sq. m
Weight empty	35.5 tons
Maximum take-off weight	61 tons
Maximum fuel capacity	58 tons
Maximum fuel capacity	22.066 tons
Maximum speed at level flight	650 km/hr
Cruising speed	516 km/hr
Maximum range (with a take-off weight of 61 tons)	5,463 km
Maximum endurance	10 hours 50 minutes
Service ceiling	10,200 m
Take-off run	1,270 m
Landing run	1,050 m
Engine power (per engine)	4,250 equivalent hp

3012

CSO: 4008/106

Birth Control

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et al.

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TITLE: "Clinical Study of a Long-acting Progestogen Contraceptive 3-Cyclopentyl Propionate of Megestrol Acetate (Progestin No 1)"

SOURCE: Shanghai SHENGZHI YU BIYUN [REPRODUCTION AND CONTRACEPTION] in Chinese No 2, 1983 pp 36-38

TEXT OF ENGLISH ABSTRACT: This paper reports the clinical study made of new synthetic progestogen 3-cyclopentyl propionate of megestrol acetate (Progestin No 1) in the last 10 years. It has been synthesized in China as a new anti-fertility agent for women. It was given orally once a month in combination with small amounts of quinestrol (100 mg Progestin No 1 and 0.5 mg quinestrol), administered on the 10th day of the menstrual cycle before ovulation, and in another group half the dose was repeated on the 16th day for comparison. The clinical results of the latter group were better. In 1,213 healthy volunteer women, 9,651 (women months) treatment cycles were observed. The efficacy was 99.1 percent (calculated by women years) with very few side effects. During

[Continuation of SHENGZHI YU BIYUN No 2, 1983 pp 36-38]

treatment the duration and the amount of menstruation were normal. In the recent follow-up, no abnormal findings were revealed in physical and laboratory examinations. Soon after the drug was discontinued, menstruation recovered normally and the treatment did not interfere with re-pregnancy. In light of clinical and laboratory studies, the contraceptive mechanism was discussed and it was suggested that the antifertility effect was multiple. The drug has definite anti-ovulation and anti-implantation effects. A certain relationship exists between anti-implantation effectiveness and the time of administration.

It is concluded that progestogen 3-cyclopentyl propionate of megestrol acetate (Progestin No 1) is a new effective antifertility agent.

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et al.

ORG: All of the Planned Parenthood Research Institute of Dalian

TITLE: "A Technical Research on Termination of Early Pregnancy"

SOURCE: Shanghai SHENGZHI YU BIYUN [REPRODUCTION AND CONTRACEPTION] in Chinese
No 2, 1983 pp 42-44

TEXT OF ENGLISH ABSTRACT: The research on contraceptives for embryogenesis and the termination of early pregnancy by applying PG, some Chinese medicinal herbs and LH, etc., has made outstanding achievements both at home and abroad. However, these achievements cannot be considered satisfactory yet because the time needed for abortion is long and the embryo cannot be evacuated completely. In particular, during the early stage of pregnancy, induction of menstruation and stoppage of pregnancy with medicine cannot be considered ideal.

However, by utilizing a capillary mechanical method, a simpler sweeping and absorbing operation is performed in the uterus cavity 2-10 days after menstruation. The uterus' internal membrane can be peeled off, thus interrupting the pregnancy physiology. The embryo can thus be eliminated at the earliest stage and

[Continuation of SHENGZHI YU BIYUN No 2, 1983 pp 42-44]

induction of menstruation and stoppage of pregnancy can be brought about quickly.

From the clinical observations made on 200 cases selected at random out of 1400 cases and controls, it is shown that the abortion time is shortened, and that the embryo is eliminated thoroughly. This occurs with faster results, less bleeding and slighter pains, and without side effects. Therefore, it may be regarded as a safe, reliable new technology for termination of earliest pregnancy.

9717
CSO: 4009/163

AUTHOR: None

ORG: Standardization Office, Dalian Research Institute of Diesel Locomotives

TITLE: "Recent Condition of Railway Locomotive Standardization Work"

SOURCE: Dalian NEIRAN JICHE [DIESEL LOCOMOTIVE] in Chinese No 4, 15 Apr 83
pp 51-inside backcover

ABSTRACT: For the purpose of implementing the State's standardized management rules to promote railway locomotive standardization, a document detailing the 1981-82 standardization plan was issued by the Ministry of Railways to require all subordinate plants and research institutes to formulate standards for steam and diesel locomotives and their major parts. Following repeated solicitation of opinions and extensive visits of various plants, railway bureaus, and colleges, several meetings were organized in Changxingdian, Dalian, Leyang, Shenyang, and Lanzhou to absorb and unify the understandings of cadres, specialists, professors, technicians, and workers so that the various standards may be timely enacted. In 1981 29 ministerial items drafted by Dalian Research Institute of Diesel Locomotives and approved by the Ministry of Railways, in addition to 47 items for diesel locomotives and 4 items for steam locomotives were published. In late 1982, various State standards, ministerial standards, and general purpose parts were further approved and published, including the official change of the traditional term "internal combustion locomotive" to "diesel locomotive" and 1392 terms and 540 technical phrases. Contents of these standardization documents are briefly introduced.

AUTHOR: None

ORG: Service Team, Qishuyan Locomotive and Car Plant, Nanjing East Section Locomotive Technology Office, Shanghai Bureau of Railways

TITLE: "Test Operation of 16280 Diesel Engine Installed in the Diesel Locomotive Dongfeng-4 No 0267"

SOURCE: Dalian NEIRAN JICHE [DIESEL LOCOMOTIVE] in Chinese No 4, 15 Apr 83
backcover

ABSTRACT: According to the document (81) Tiejizi No 2060, the 16280-diesel engine had been tested for 100 hours and 360 hours before a 200,000 km line operation test was ordered by the Ministry of Railways, with the engine installed in the Dongfeng-4 No 0267 diesel locomotive. Due to the fact that the external measurements of the 16280-diesel engine are the same as those of the 16240-diesel engine originally in the locomotive, the installation was smoothly completed on 20 Dec 82, after nearly 2 months of work. The new engine is 2.64 tons heavier making the reconstructed locomotive to weigh a total of 140,435 tons, within the design limit of 142 tons. Operation of the refitted locomotive began on 1 Jan 83 and by 17 Jan 83, the No 0267 locomotive had operated safely for 7372 km.

6168

CSO: 4009/166

AUTHOR: LIU Qiuying [0491 4428 5391]

ORG: None

TITLE: "Designs of 13 Types of CMOS Integrated Circuits Finalized"

SOURCE: Beijing DIANZI KEXUE JISHU [ELECTRONIC SCIENCE AND TECHNOLOGY] in Chinese No 5, 1983 p 7

ABSTRACT: The designs of 13 types of CMOS integrated circuits to be produced by Beijing Municipal Semiconductor Device Plant No 3 have recently been approved. The normal temperature, high temperature, and low temperature DC parameters of the 13 products reach the military grade industrial standards (JEDEC) of American Association of Electronic Engineering for CMOS devices. The maximum work frequencies are close to the products of the CD4000B series of the RCA Company and the MC14000B series of the Motorola Company of the USA. This is the first group of domestic CMOS integrated circuits made in accordance with international standards. They are completely interchangeable with the CD4000 series of RCA or the MC14000 series of Motorola. A brief description of all 13 CMOS devices is included.

AUTHOR: XUE Dongwei [5641 2639 0251]

ORG: None

TITLE: "KWD-1 Helmet Style Radio [Cordless Telephone]"

SOURCE: Beijing DIANZI KEXUE JISHU [ELECTRONIC SCIENCE AND TECHNOLOGY] in Chinese No 5, 1983 p 36

ABSTRACT: The KWD-1 helmet style radio is a new portable super-miniature short-wave frequency modulation radio communication equipment made by Shanghai Municipal Mechanized Construction Company. It has sound-controlled automatic transfer of receiving and dispatching signals and is constructed with all integrated circuits. Its major technical properties have reached the indices for ordinary hand-held radio telephones yet it is at the same time a helmet. The worker has both hands free to talk over the phone while working. It is suitable for workers of modern highrise building construction, cable installation, metallurgy, heavy machinery, bridge construction, shipbuilding, etc. as well as for firemen, rescue workers, paratroopers, etc. Its major technical properties are briefly introduced.

6248

CSO: 4009/174

Engineering

AUTHOR: YANG Maolin [2799 5399 2651]
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LI Xiangyi [2621 6272 4135]

ORG: All of the Beijing Institute of Aeronautics and Astronautics

TITLE: "Trajectory with Diffusion Method for Predicting the Fuel Distribution in a Transverse Stream"

SOURCE: Beijing GONGCHENG REWULI XUEBAO [JOURNAL OF ENGINEERING] in Chinese
No 2, 1983 pp 189-191

TEXT OF ENGLISH ABSTRACT: Based upon experiments, a semi-empirical method to predict the liquid fuel distribution in a target plane downstream of a plain orifice injector in a cross air stream is proposed. A normalized version of drop-size distribution function has been used. Using a modified drag coefficient for fuel droplets, a simple trajectory equation is obtained. An equivalent diffusion coefficient is selected to determine the diffusion from an imaginary equivalent point source. The calculated fuel concentration profile is in good agreement with the experimental results.

AUTHOR: WU Shousheng [0702 1108 3932]

ORG: Beijing Institute of Aeronautics and Astronautics

TITLE: "Analysis and Development of a Simple Emission Model for Gas Turbine Combustors"

SOURCE: Beijing GONGCHENG REWULI XUEBAO [JOURNAL OF ENGINEERING] in Chinese
No 2, 1983 pp 200-207

TEXT OF ENGLISH ABSTRACT: An attempt is made to investigate the characteristics of a simple emission model for predicting nitric oxide (NO) from gas turbine combustors and to explain why this model yields good predictions of the trend in NO_x emissions. Based on such an effort, the author extends the model to make it able to predict carbon monoxide (CO) levels--another important pollutant in gas turbine combustors. A global kinetic equation for CO oxidation, coupled with an empirical correlation relating the initial concentration of CO with the equivalence ratio of the primary zone, has been employed in the model. Good agreement is obtained between predicted and experimental data.

AUTHOR: ZHOU Lixing [0719 0500 5887]
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ORG: Both of Qinghua University

TITLE: "Ignition of Pulverized Coal Flame by a High Temperature Plasma Jet"

SOURCE: Beijing GONGCHENG REWULI XUEBAO [JOURNAL OF ENGINEERING] in Chinese
No 2, 1983 pp 208-212

TEXT OF ENGLISH ABSTRACT: An integro-numerical method has been developed to study the ignition of pulverized coal flame by a high temperature arc plasma jet with different coal feeding rate, different arc power and different coal rank. Numerical computations give the temperature, velocity and concentration distributions of the gas phase and particle phase in various cases. Calculation results qualitatively agree with the results obtained in engineering tests and the phenomena observed in cited references. Some of the conclusions, such as the much stronger effect of volatile contents than that of heating value, probably are important for developing the engineering facilities.

9717
CSO: 4009/168

Geotechnical Engineering

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TITLE: "Ground Improvement of a Power Plant by Stone Columns"

SOURCE: Nanjing YANTU GONGCHENG XUEBAO [CHINESE JOURNAL OF GEOTECHNICAL ENGINEERING] in Chinese No 1, 1983 pp 43-50

TEXT OF ENGLISH ABSTRACT: The subsoil (mainly sandy clay and silty sand) at the site of the proposed Nantong Power Plant has been improved by the use of stone columns. This paper documents the results of field tests and measured settlements of structures. Field tests consisted of (1) seven large scale plate loading tests (plate's area 3x3 m), (2) measurement of vertical stresses on columns and surrounding soil, (3) determination of the relationship between the peak particle velocity on the ground surface caused by the operation of the vibrator during installation and the distance from the vibrator, and (4) the change in blow counts of ground soils after installation. At present, the building has settled in the range of 3-10 cm and the degree of consolidation is estimated to be over 80 percent. The main building and the foundations of all facilities are in good condition and show no signs of foundation difficulties.

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ORG: Both of the Northwest Hydrotechnical Science Research Institute, MWCEP, Wugong, Shanxi

TITLE: "Shear Strength of Sandy Gravels in the Shitouhe River Dam"

SOURCE: Nanjing YANTU GONGCHENG XUEBAO [CHINESE JOURNAL OF GEOTECHNICAL ENGINEERING] in Chinese No 1, 1983 pp 90-101

TEXT OF ENGLISH ABSTRACT: Integrating with the design and construction of the high earth and rockfill dam on the Shitouhe River, the experiments on shear strength of big grain size sandy gravel, the cover material of the dam, were made with a 2x2x1 m large-scale double box-type direct shear apparatus. According to the analysis of the method and results of the test, the new criteria for selection of designed values of sandy gravels is recommended. By adopting it, the cross sectional area of the dam may be greatly reduced when compared with the original design.

9717
CSO: 4009/171

Space Science

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ORG: All of Qinghua University

TITLE: "Methods of Large-scale Systems and Satellite Attitude Dynamics"

SOURCE: Beijing KONGJIAN KEXUE XUEBAO [CHINESE JOURNAL OF SPACE SCIENCE]
in Chinese Vol 3 No 2, 1983 pp 81-102

TEXT OF ENGLISH ABSTRACT: This paper presents a method that can be applied to analysis of the stability of nonlinear unsteady mechanical systems based on Chetaev's theory and the theory of the large-scale systems: methods of large-scale systems with weighted V function. Moreover, this method is used for research on the problems of attitude stability of dual-spinning satellites, large flexible spacecrafts and satellites with a cavity containing fluid. It can be seen that this method can be applied effectively to analyze the stability of the mechanical systems with constraint damping, the gyrosystems and the complex systems of the spacecraft.

AUTHOR: JIA Wenkui [6328 2429 1145]

ORG: Space Science and Technology Center, Chinese Academy of Sciences

TITLE: "Research on Methods for Determining the Magnetic Moment of a Satellite in Earth's Magnetic Field"

SOURCE: Beijing KONGJIAN KEXUE XUEBAO [CHINESE JOURNAL OF SPACE SCIENCE]
in Chinese Vol 3 No 2, 1983 pp 103-112

TEXT OF ENGLISH ABSTRACT: Magnetic design and test should be considered in the design and making of a satellite because the magnetic torques resulting from the interaction between the magnetic properties of the satellite and the ambient magnetic field tend to disturb its attitude.

This paper presents the ambient field mapping method to determine a satellite's magnetic moment. Its main point is to acquire experimentally and deduce mathematically the magnetic field data of a satellite in the limited region of earth's field. In order to do that we must overcome two main difficulties: separating permanent moment from induced moment and effectively inhibiting the noise of earth's field. This method has resolved these problems by using the following techniques in a better way:

1. Repeating measurement at the original and inclined (or inverse) position;
2. Obtaining the difference between the outputs from the measuring probe and the reference probe;

[Continuation of KONGJIAN KEXUE XUEBAO Vol 3 No 2, 1983 pp 103-112]

3. Letting the axis of the probe direct to the earth's field east, turning the test subject over 90° to keep the relative magnetic state between it and the probe.

The results that have been obtained by analysis and tests indicate that the error is not more than 10 percent for magnetic moment above 500 mA-m^2 . It can be expected that the precision can be increased after improvement.

9717

CSO: 4009/159

Underground Engineering

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TITLE: "Colossal Slump in Severely Weathered Basalt Successfully Controlled by an Engineering Regiment"

SOURCE: Chongqing DIXIA GONGCHENG [UNDERGROUND ENGINEERING] in Chinese No 4,
11 Apr 83 pp 25-27

ABSTRACT: In the process of excavating for an underground oil storage tank, an engineering regiment discovered an interbedded layer of tuff, intruding into the body of the tank just below the circular beam of the already completed cap. The discovery was too late to adopt any supporting measure to stop the surrounding rock above ~~this~~ soft layer from collapsing. As the load on the cap continued to increase, it fractured and slumped 126°, followed by a loss of stress equilibrium of the surrounding rock to result in a total of 95 cave-ins. The engineering regiment applied a rescue scheme to save the tank. Compared with excavating a new tank, the rescue operation cost 100,000 yuan less and took 50 percent of the time to complete. This successful rescue scheme is described in detail, with drawings depicting the tank structure, the tuff layer, the fracture, and the support measures.

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CSO: 4009/170

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